

# Missouri's 2021 Timber Products Output Report



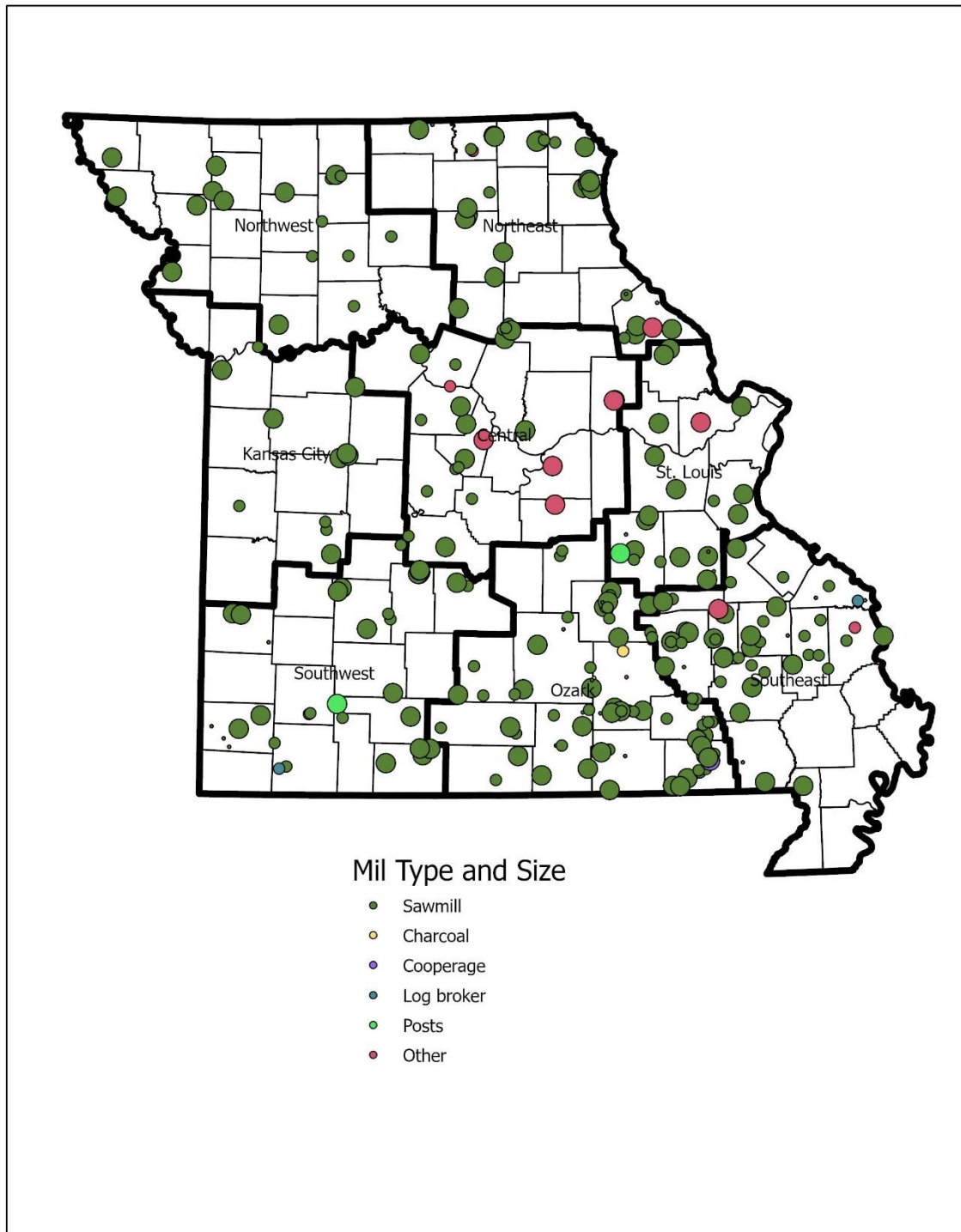


Figure 1 - Locations of active primary wood-using mills with mill type (size of dot indicates mill volume), Missouri, 2021

# 2021 MDC Timber Product Output (TPO) Report

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*Tom Treiman and Mike Morris, Missouri Department of Conservation, Oct. 2022*

In the late winter and spring of 2022, Missouri Department of Conservation foresters set out to conduct interviews with 137 mill owner/operators, a random sample of primary wood processors throughout the state, asking for information on their firms from 2021. In this report we present forest industry trends, harvest levels and other details. Such detailed information is necessary for intelligent planning and decision making in wood procurement, forest resources management, and forest industry development. Likewise, researchers need current forest industry and industrial roundwood information for planning projects.

Following USFS guidelines, the survey sample consisted of 137 mills, out of approximately 350 mills that were or had been operating in Missouri as listed in MDC's online database of primary mills (<https://mdc12.mdc.mo.gov/applications/momills/momillssearch.aspx>). The 95 responses represent about a 69% response rate. (Response Table 1.)

Because of this low response rate, analyses in this report are based on a combination of this new data and reprocessed data from earlier surveys, which may not match earlier published data. Totals are calculated based on the samples mills current data, and on data from previous years for mills that were not sampled. (Response Table 2.) Given the age of some of the data, all results should be used with caution.

Interview Results	Surveys	Rate
In-person	95	69.3%
Unavailable	27	19.7%
Refused	15	11.0%
<b>Total</b>	137	

Response Table 1 - Response rates for the 2021 TPO survey

<b>Data Year</b>	<b># Mills</b>	<b>Pct</b>
2022	88	28.0%
2021	76	24.2%
2020	43	13.7%
2019	53	16.9%
2018	21	6.7%
2016	24	7.6%
2014	4	1.3%
2011	4	1.3%
2008	1	0.3%

Response Table 2 – Table of the year of the most recent data (on products, mill types, species, and source counties) for each mill

Data from surrounding states (imports from Missouri) is unavailable at the time of writing. As other states report, figures in this report may become out-of-date.

All board foot data in this report have been converted to International 1/4-inch scale by applying a multiplier of 1.08 to all roundwood volumes reported in Scribner Decimal C scale by sawmills and handle mills, a multiplier of 1.04 to all roundwood volumes reported in Scribner Decimal C scale by veneer and cooperage mills, a multiplier of 1.38 to all roundwood volume reported in Doyle scale by sawmills and handle mills, and a multiplier of 1.14 to all roundwood volume reported in Doyle scale by veneer and cooperage mills.

- In 2021, Missouri's primary wood using industry was comprised of 296 sawmills, 2 cooperage mills, 4 post and pole mills, 4 charcoal plants, 5 log brokers, and 14 mills producing other products (Table 1).

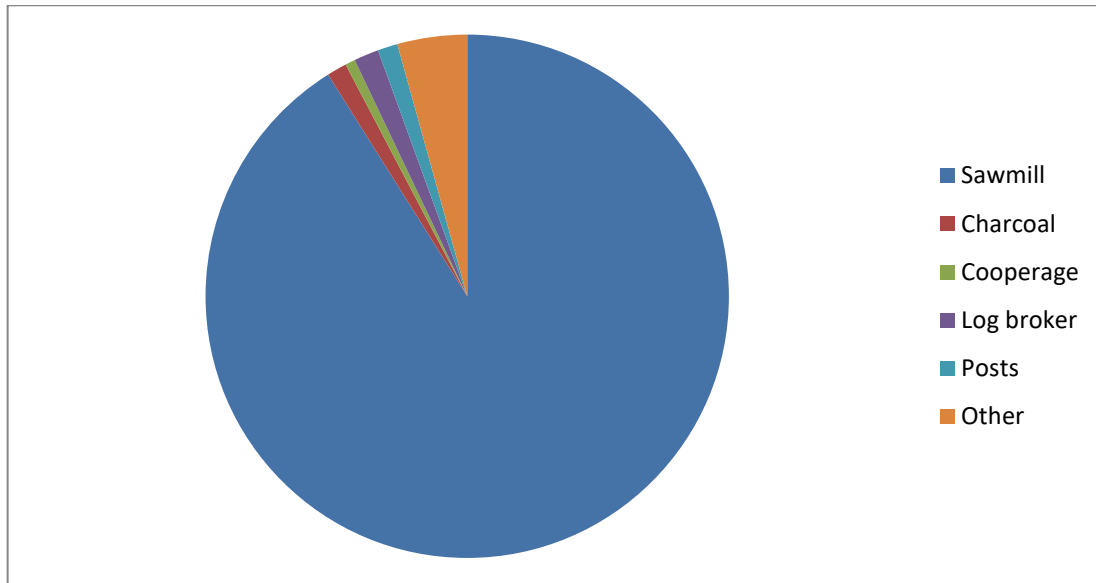


Figure 2 - Mills by type, 2021.

- Circular sawmills accounted for 52% of total volume and band sawmills for about 30%. (Table 8)

- Since the 1990s, the number of mills in Missouri has changed little, compared to major declines earlier in the 20<sup>th</sup> century.

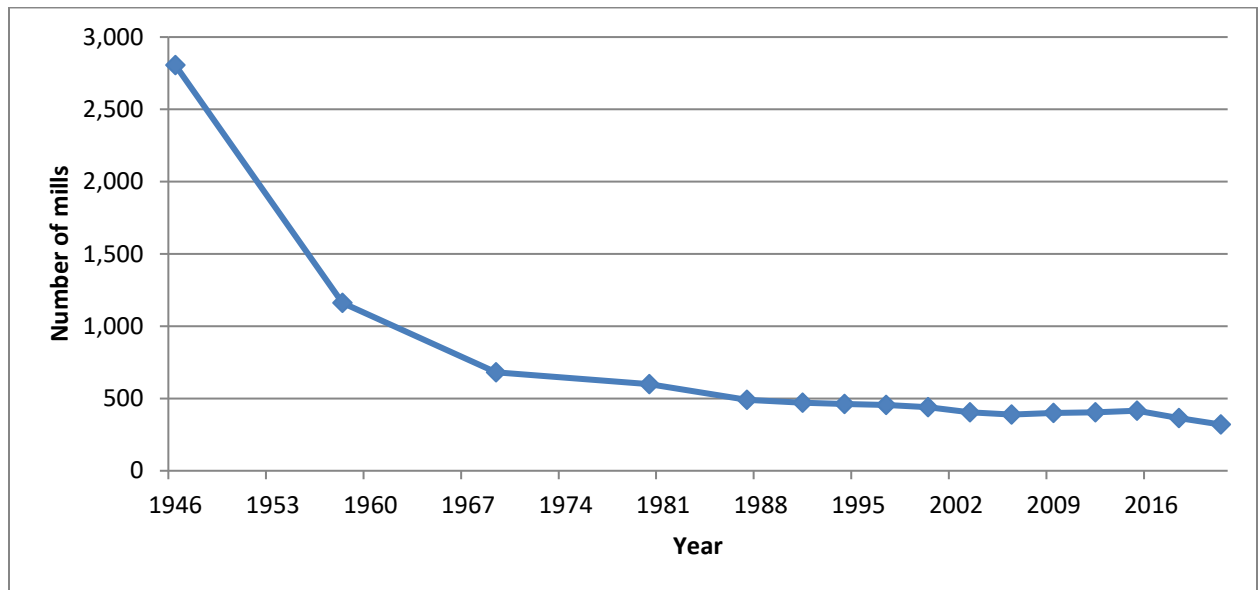


Figure 3 - Number of Missouri mills over time.

- In 2021 the total number of sawmills in Missouri was 296 compared with 342 mills in 2018.

- There were 33 large mills (with an annual lumber production of 5 million board feet or more).

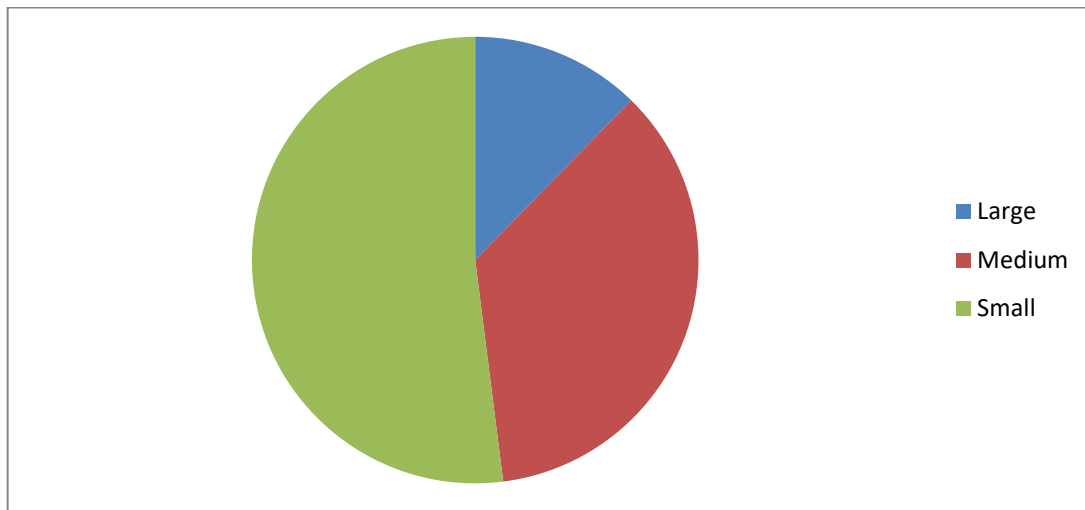


Figure 4 - Mills by size, 2021.

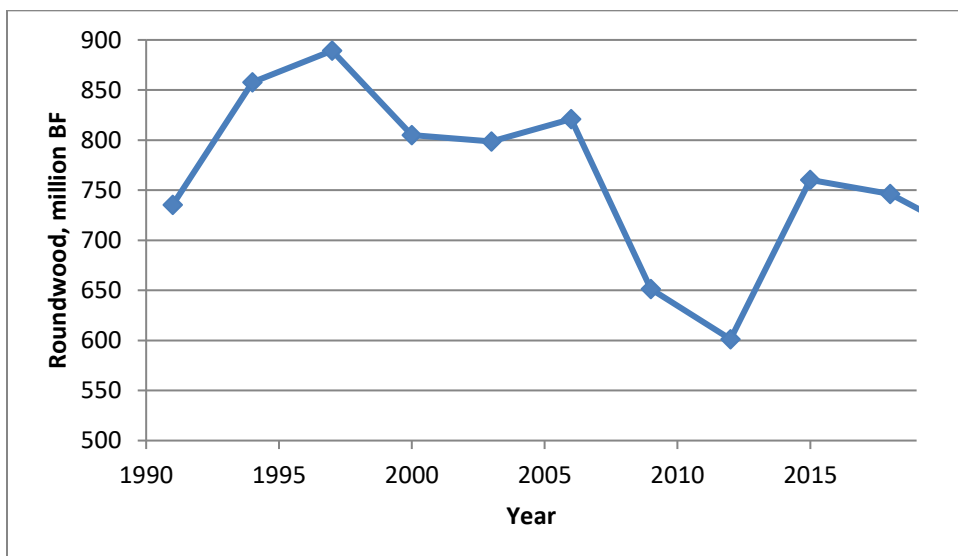


Figure 5 - Mill receipts over time.

- In 2021, the primary wood-using mills in Missouri processed about 704,000 MBF of industrial roundwood. (

- Table 2)
- About 57,000 MBF harvested from other states was reported by Missouri mills.  
(Table 4)
- Based on 2009 data (the latest available), other states, primarily Kentucky and Iowa, imported about 44,600 MBF of roundwood from Missouri (including from Missouri log brokers.)
- About 8% of the industrial roundwood processed by Missouri mills consisted of softwood species (



- Table 2).
- About 87% consisted of sawlogs and bolts. (Table 8)
- In 2021, the MDC's Ozark Region was the leading supplier of industrial roundwood in Missouri, with about 226,000 MBF, or about 35% of the total industrial roundwood produced. The Southeast Region was second with 22%. (

- Table 2)
- The top counties for industrial roundwood supply included Shannon, Washington, and Texas.

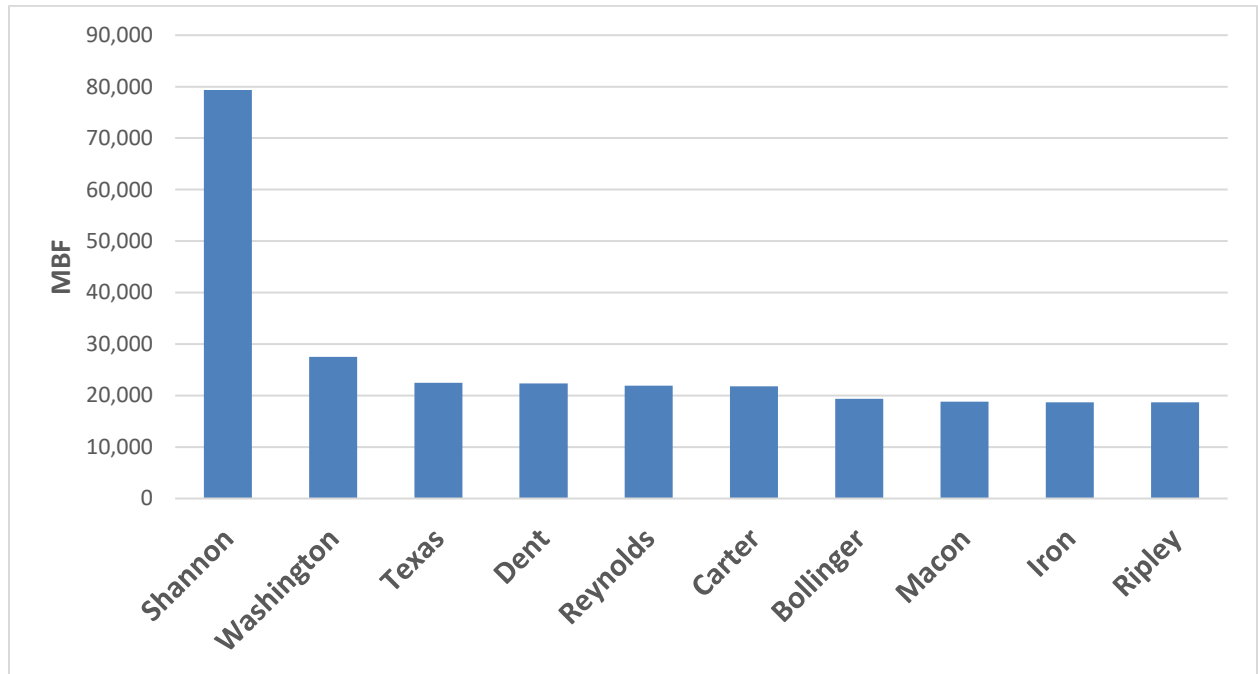


Figure 6 - Top counties by harvest, 2021.

- Red oaks were the most harvested species in 2021, accounting for 44% of the total industrial roundwood volume. White oaks at about 27% and shortleaf pine at about 6% were other major species harvested. (

- Table 2)

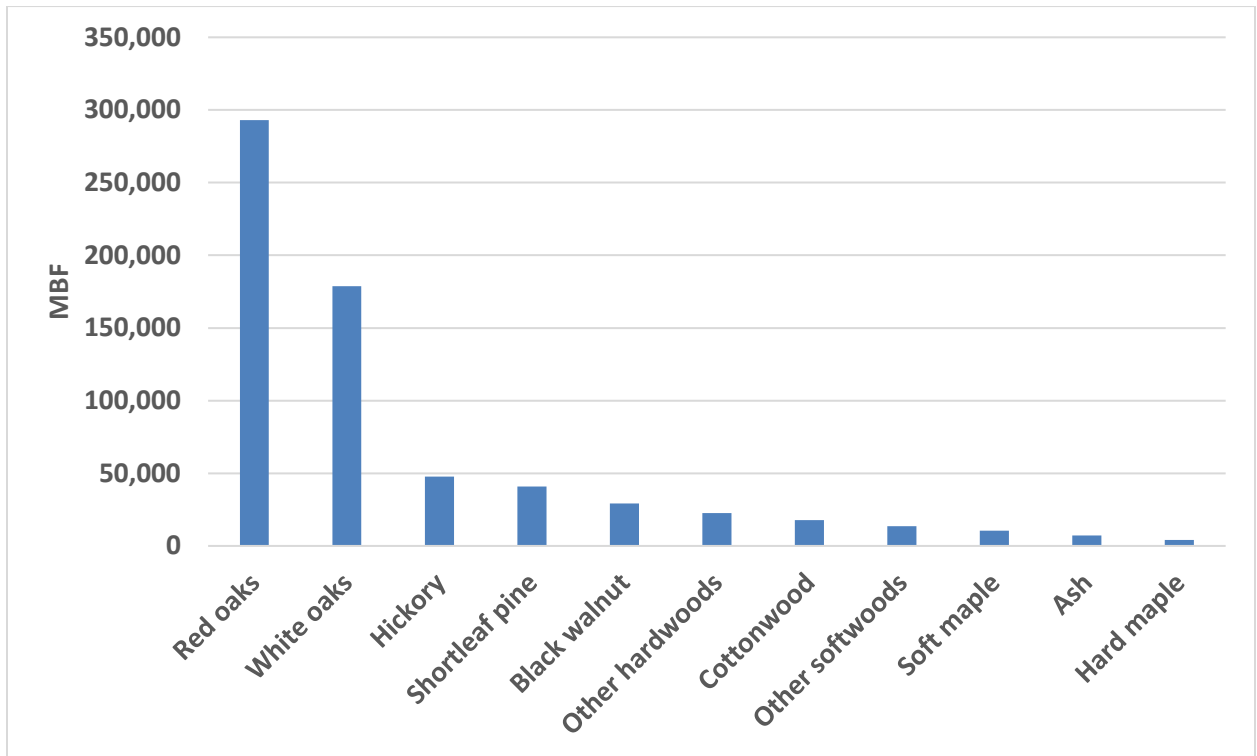


Figure 7 - Top species, 2021.

- Comparing harvest results from the 2021 primary wood processor survey with 2021 growth results from Forest Inventory and Analysis plot work, shows that the Ozark, Northeast, and Southeast Regions cut the largest percentage of their growth, at about 50%, while the Kansas City Region cut the smallest percentage of growth, 16%. Nearly 71% of red oak growth was harvested statewide. (Table 5)

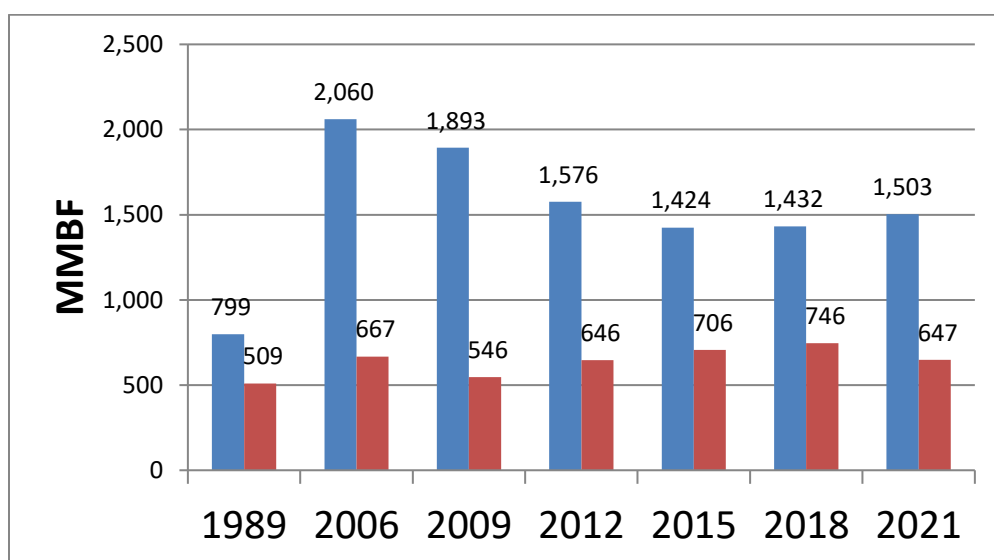


Figure 8 – Growth vs. harvest over time.

- Using USFS formulae, Missouri mills produced about 1.7 million green tons of residues in 2021. The bulk of this was coarse residues (suitable for chipping) from hardwoods (Table 6).
- Weighting responses by mill volume, less than 6% of mill residues went unused. Over 30% were used for charcoal and 33% or so were used for “miscellaneous and other” purposes (Table 7 – Use of residues, weighted by mill size, Missouri, 2021. Table 7).
- While 95% of sawmill residues are currently being utilized, very little harvest residue is utilized. According to 2009 data, 102.6 million cubic feet of wood was utilized in that year. An additional 71.6 million cubic feet of

wood was generated from logging slash, logging residues, cull trees, etc. The vast majority of this woody material is not currently being utilized.

- Using 2021 price data from Missouri Timber Price Trends (TPT), an estimated \$159 million could potentially have been paid to landowners for the timber harvested. This includes about \$66 million for red oaks, \$47 million for white oaks and nearly \$23 million for walnut. TPT price figures are, however, based only on reports from MDC, consulting, or other professional foresters. As such they represent prices at well-managed, marked and monitored timber sales. For those landowners who do not use a professional forester, the presumption is that prices are significantly lower, so the actual total paid to landowners in 2021 is surely less than \$159 million.
- In 2020, the most recent available data, forest products, wood, lumber, paper and related industries contributed \$9.5 billion to the Missouri economy, in 2021 dollars. These industries support over 37,000 jobs at a payroll of over \$2 billion and are responsible for nearly \$700 million in taxes that help to run our state and country, including \$100 million in state sales tax. These numbers include logging and sawmill operations, secondary wood products, furniture and cabinet makers, log cabins, paperboard manufacturing and so on. The grand total includes not only the direct effect of jobs in the industry but secondary effects in the economy as a whole. Secondary effects are the changes in economic activity from subsequent rounds of re-spending of primary dollars. There are two types of secondary effects: 1) Indirect effects are the changes in sales, income, or employment within the region in backward-linked industries supplying goods and services to forest products industry. 2) Induced effects are the increased sales within the region from household spending of the income earned in the forest products and

supporting industries. Forest products employees spend the income they earn from tourism on housing, utilities, groceries, and other consumer goods and services. This generates sales, income, and employment throughout the region's economy.

**Table 1 – Number of active primary wood-using mills by MDC Region, Missouri, 2021.**

Type	Size	Total	Central	Kansas City	Northeast	Northwest	Ozark	Southeast	Southwest	St. Louis	2018
Sawmill	Large	33	2		3		8	8	6	6	36
	Medium	108	12	5	8	8	34	27	10	4	123
	Small	155	9	9	27	12	38	24	21	15	183
<b>Subtotal</b>		<b>296</b>	<b>23</b>	<b>14</b>	<b>38</b>	<b>20</b>	<b>80</b>	<b>59</b>	<b>37</b>	<b>25</b>	<b>342</b>
Charcoal	Large	2					2				
	Medium	1					1				
	Small	1					1				
<b>Subtotal</b>		<b>4</b>					<b>3</b>				<b>3</b>
Cooperage	Small	2	1				1				
<b>Subtotal</b>		<b>2</b>	<b>1</b>				<b>1</b>				<b>2</b>
Log broker	Large	2			1			1			
	Medium	3				1		1	1		
	Small										
<b>Subtotal</b>		<b>5</b>			<b>1</b>	<b>1</b>		<b>2</b>	<b>1</b>		<b>9</b>
Posts	Large	1					1				
	Medium	1					1				
	Small	2							1	1	
<b>Subtotal</b>		<b>4</b>					<b>2</b>				<b>5</b>
Other	Large	2					1	1			
	Medium	3	1		1			1			
	Small	9	5		2			1		1	
<b>Subtotal</b>		<b>14</b>	<b>6</b>		<b>3</b>		<b>1</b>	<b>3</b>		<b>1</b>	<b>13</b>
<b>Total</b>		<b>325</b>	<b>30</b>	<b>14</b>	<b>42</b>	<b>21</b>	<b>87</b>	<b>64</b>	<b>38</b>	<b>26</b>	<b>374</b>

**Table 2 – Harvest volume by species group and MDC Region, Int. MBF, Missouri, 2021.**

Species Group	Total (MO)	Pct. of Total	MDC Region								Out of State
			Central	Kansas City	Northeast	Northwest	Ozark	Southeast	Southwest	St. Louis	
Shortleaf pine	38,598.5	6.0%	187.1				25,558.8	5,783.1	252.6	6,816.9	3,443.1
Other softwoods	13,375.1	2.1%	2,319.5	95.9	215.1	61.2	802.8	78.8	9,590.9	211.0	1,523.5
White oaks	174,594.3	27.0%	18,161.6	3,410.2	14,636.3	4,000.1	57,498.6	40,349.4	15,385.9		11,066.2
Red oaks	285,185.3	44.1%	19,762.5	3,839.7	15,353.7	4,665.6	117,031.8	68,108.9	30,100.6		17,945.2
Hickory	46,555.2	7.2%	3,969.9	560.5	2,641.5	912.2	21,068.8	12,425.7	2,577.4	2,399.2	3,128.4
Hard maple	3,999.9	0.6%	173.6	105.6	410.0	3.3	25.3	2,150.5	649.9	481.8	1,314.1
Soft maple	10,404.1	1.6%	1,785.6	231.3	4,064.2	2,290.6	151.3	1,077.0	314.7	489.5	610.2
Ash	7,072.6	1.1%	605.4	306.5	778.1	468.4	465.7	3,038.5	1,182.5	227.4	2,007.4
Cottonwood	17,324.5	2.7%	1,971.8	216.2	5,814.8	6,443.5	428.3	934.4	555.6	960.0	1,579.3
Black walnut	28,199.5	4.4%	3,283.0	4,614.5	1,489.7	3,729.1	1,764.8	889.0	11,615.8	813.5	9,314.5
Other hardwoods	21,965.4	3.4%	2,655.0	617.2	3,080.9	2,279.7	1,497.8	7,229.8	3,435.5	1,169.6	4,966.2
<b>Total</b>	647,274.3		54,875.0		48,484.1	24,853.7	226,293.9	142,064.9	75,661.3		56,898.1
Pct. of Total			8.5%	2.2%	7.5%	3.8%	35.0%	21.9%	11.7%	9.4%	



**Table 3 – Harvest volume by county, Int.  
MBF, Missouri, 2021.**

County	Region	Volume
Adair	Northeast	2,891.8
Andrew	Northwest	160.2
Atchison	Northwest	174.3
Audrain	Central	2,549.3
Barry	Southwest	7,141.0
Barton	Southwest	2,291.7
Bates	Kansas City	1,868.7
Benton	Kansas City	2,101.6
Bollinger	Southeast	19,384.0
Boone	Central	6,322.1
Buchanan	Northwest	1,824.6
Butler	Southeast	7,583.1
Caldwell	Northwest	547.7
Callaway	Central	1,049.4
Camden	Central	6,050.9
Cape Girardeau	Southeast	14,551.9
Carroll	Northwest	2,305.0
Carter	Ozark	21,812.5
Cass	Kansas City	599.5
Cedar	Southwest	1,891.8
Chariton	Northwest	6,775.6
Christian	Southwest	6,242.6
Clark	Northeast	2,887.5
Clay	Kansas City	233.2
Clinton	Northwest	139.3
Cole	Central	5,152.6
Cooper	Central	2,265.8
Crawford	St. Louis	15,314.6
Dade	Southwest	2,015.7
Dallas	Southwest	3,421.4
Daviess	Northwest	1,421.4
De Kalb	Northwest	222.7
Dent	Ozark	22,368.5
Douglas	Ozark	10,590.9
Dunklin	Southeast	240.9
Franklin	St. Louis	6,088.9
Gasconade	Central	4,519.7
Gentry	Northwest	1,714.6

County	Region	Volume
Greene	Southwest	2,598.7
Grundy	Northwest	2,296.3
Harrison	Northwest	900.5
Henry	Kansas City	2,258.7
Hickory	Southwest	1,988.4
Holt	Northwest	184.1
Howard	Central	3,050.6
Howell	Ozark	7,761.7
Iron	Southeast	18,710.7
Jackson	Kansas City	178.9
Jasper	Southwest	2,580.8
Jefferson	St. Louis	6,524.2
Johnson	Kansas City	574.3
Knox	Northeast	982.6
Laclede	Southwest	4,772.6
Lafayette	Kansas City	222.1
Lawrence	Southwest	5,441.3
Lewis	Northeast	2,156.6
Lincoln	St. Louis	3,258.5
Linn	Northwest	1,083.1
Livingston	Northwest	3,927.0
McDonald	Southwest	5,709.7
Macon	Northeast	18,781.0
Madison	Southeast	16,207.2
Maries	Central	4,802.3
Marion	Northeast	1,009.7
Mercer	Northwest	530.6
Miller	Central	4,634.7
Mississippi	Southeast	47.4
Moniteau	Central	1,643.3
Monroe	Northeast	2,525.6
Montgomery	Central	1,447.9
Morgan	Central	6,826.1
New Madrid	Southeast	2,225.4
Newton	Southwest	9,159.6
Nodaway	Northwest	372.8
Oregon	Ozark	15,340.8
Osage	Central	3,164.5
Ozark	Ozark	8,085.7
Pemiscot	Southeast	8.9

County	Region	Volume
Perry	Southeast	12,346.9
Pettis	Kansas City	675.1
Phelps	Ozark	7,560.6
Pike	Northeast	5,508.9
Platte	Kansas City	87.0
Polk	Southwest	3,155.7
Pulaski	Ozark	6,242.3
Putnam	Northeast	270.3
Ralls	Northeast	2,870.0
Randolph	Northeast	4,390.0
Ray	Northwest	368.8
Reynolds	Southeast	21,891.5
Ripley	Ozark	18,657.3
St Charles	St. Louis	475.5
St Clair	Kansas City	3,440.8
Ste. Genevieve	Southeast	2,079.8
St Francois	Southeast	2,499.9
St Louis	St. Louis	516.8
Ste Genevieve	Southeast	585.7
Saline	Central	1,712.8
Schuyler	Northeast	864.3

County	Region	Volume
Scotland	Northeast	2,038.9
Scott	Southeast	4,429.2
Shannon	Ozark	79,370.5
Shelby	Northeast	830.0
Stoddard	Southeast	2,301.5
Stone	Southwest	3,287.2
Sullivan	Northeast	846.2
Taney	Southwest	10,190.2
Texas	Ozark	22,449.3
Vernon	Kansas City	1,791.7
Warren	St. Louis	1,200.7
Washington	St. Louis	27,493.2
Wayne	Southeast	17,371.4
Webster	Southwest	4,002.2
Worth	Northwest	152.7
Wright	Ozark	6,063.3
City of St. Louis	St. Louis	303.3
<b>Subtotal</b>		649,013.1
<i>Not reported</i>		515.6
Out of State		56,569.0
<b>Grand Total</b>		706,097.7

**Table 4 –Volume of wood received from other states, Int. MBF, Missouri, 2021.**

State	Volume
Arkansas	18,710.83
Illinois	22,441.76
Iowa	2,929.18
Kansas	4,880.38
Kentucky	3,945.38
Michigan	423.03
Nebraska	82.8
Oklahoma	2,531.33
Tennessee	624.34
<i>Not reported</i>	515.6
<b>Total</b>	<b>57,084.6</b>

**Table 5 – Percentage of 2021 growth of sawtimber on forestland (from FIA plot data) harvested (from mill survey), by species group and by MDC Region Missouri, 2021.**

Species Group	Total
Shortleaf pine	36.9%
Other softwoods	36.4%
White oaks	42.8%
Red oaks	71.0%
Hickory	31.4%
Hard maple	18.7%
Soft maple	24.0%
Ash	24.8%
Cottonwood	56.6%
Black walnut	34.9%
Other hardwoods	13.9%
<b>Total</b>	<b>44.3%</b>

Region	Total
Northwest	30.2%
Kansas City	16.0%
Central	30.8%
Northeast	52.0%
St. Louis	45.6%
Southeast	49.4%
Southwest	36.9%
Ozark	52.5%
<b>Total</b>	<b>43.2%</b>

**Table 6 – Estimated residue, green tons, Missouri, 2021.**

Residue	Conifer	Hardwood	Total
Bark	221,690	33,902	255,592
Coarse	873,719	79,700	953,419
Fine	508,583	46,392	554,975
Total	1,603,992	159,995	1,763,987

**Table 7 – Use of residues, weighted by mill size, Missouri, 2021.**

<b>Residue Use</b>	<b>Total</b>
A: Used for manufacture of fiber products	9.0%
B: Used for manufacture of composite products	1.3%
C: Used for charcoal	33.5%
D: Used for fuel at this mill	5.4%
E: Used for fuel elsewhere	5.4%
F: Used for domestic fuel	3.4%
G: Used for miscellaneous uses	32.4%
H: Used for other	4.3%
I: Not used	5.2%

**Table 8 - Volume received by mill and roundwood types, Int.MBF, Missouri, 2021.**

Mill Type	Sawlogs and bolts	Veneer logs	Cabin logs	Charcoal wood	Cooperage logs	Excelsior/shaving bolts	Handle bolts	Other	Poles	Posts	Total
Band sawmill	206,009.2				9,416.0			897.6			216,322.8
Circular sawmill	376,625.7		180.0				621.0	90.0	415.0		377,931.7
Scragg sawmill	35,694.8							80.0	6,000.0		41,774.8
Portable Bandsaw	2,143.2									2.0	2,145.2
Export logs - domestic	4,416.0	3,122.6									7,538.6
Export logs - international		743.5									743.5
Log broker	2,457.8										2,457.8
Tight cooperage					884.9						884.9
Untreated post mill	39.0									10,085.0	10,124.0
Treated post mill										750.0	750.0
Charcoal kiln				27,392.0							27,392.0
Excelsior/shavings mill	2,502.8					6,555.2					9,058.0
Other	857.7							19,952.0	4,000.0		24,809.7
<b>Total</b>	<b>630,746.1</b>	<b>3,866.2</b>	<b>180.0</b>	<b>27,392.0</b>	<b>10,300.9</b>	<b>6,555.2</b>	<b>621.0</b>	<b>21,019.6</b>	<b>10,415.0</b>	<b>10,837.0</b>	<b>721,933.0</b>

**Table 9 - Volume received by species group and roundwood types, Int. MBF, Missouri, 2021.**

<b>Species Group</b>	<b>Sawlogs and bolts</b>	<b>Veneer logs</b>	<b>Cabin logs</b>	<b>Char- coal wood</b>	<b>Cooper- age logs</b>	<b>Excelsior/ shaving bolts</b>	<b>Handle bolts</b>	<b>Other</b>	<b>Poles</b>	<b>Posts</b>	<b>Total</b>
Shortleaf pine	25,712.8			3,520.0		5,120.0		27.0	7,220.8	2,835.1	<b>44,435.7</b>
Other softwoods	5,604.8					1,435.2				8,001.9	<b>15,041.9</b>
White oaks	164,485.4	1,542.2	72.0	4,780.8	10,106.3			7,253.3	1,516.5		<b>189,756.5</b>
Red oaks	286,686.1	1.7	54.0	14,601.6				6,345.1	3,176.5		<b>310,865.0</b>
Hickory	44,865.5	210.7	18.0	4,001.3			621.0	965.7	208.0		<b>50,890.2</b>
Hard maple	5,330.0								2.3		<b>5,332.2</b>
Soft maple	10,636.8			96.0				440.0			<b>11,172.8</b>
Ash	8,244.8			96.0				904.0	0.8		<b>9,245.6</b>
Cottonwood	18,898.7							440.0	0.8		<b>19,339.4</b>
Black walnut	35,560.2	2,100.2			162.2			715.5	0.8		<b>38,538.8</b>
Other hardwoods	23,850.9	11.5	36.0	296.3	32.4			2,873.0	528.8		<b>27,628.8</b>
<b>Total</b>	<b>629,875.9</b>	<b>3,866.2</b>		<b>27,392.0</b>	<b>10,300.9</b>	<b>6,555.2</b>	<b>621.0</b>	<b>19,963.6</b>	<b>12,655.0</b>	<b>10,837.0</b>	<b>722,246.8</b>

